

18 due to certain informalities; rejected claims 8 and 14 under 35 U.S.C. § 112, second paragraph, due to insufficient antecedent basis; rejected claims 1-3, 6, 8, 14 and 15 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,374,251 to Fayyad et al. ("Fayyad"); rejected claims 4 and 5 under 35 U.S.C. § 103(a) as being obvious over Fayyad in view of U.S. Patent No. 5,671,381 to Strasnick et al. ("Strasnick"); rejected claims 7, 9-11, and 16-19 under 35 U.S.C. § 103(a) a being obvious over Fayyad in view of J.C. Roberts (IEEE Paper); and rejected claims 12 and 13 under 35 U.S.C. § 103(a) as being obvious over Fayyad in view of Magdi Mohammed et al. (IEEE Paper) ("Mohammed"). Applicants respectfully traverse these rejections.

#### **Summary of Applicants' Reply**

Applicants have amended claims 1, 2, 4, 5, 8, 14, 16, and 19, canceled claim 18 without prejudice or disclaimer of the subject matter thereof, and added new claims 63-64, to more distinctly claim what applicants regard as their invention. Furthermore, Applicants respectfully traverse the Examiner's rejections for at least the reasons provided. Accordingly, Applicants respectfully request the reexamination and timely allowance of the pending claims.

#### **Formal Matters**

In the Office Action, the Examiner indicated that only claims 1-19 are pending in the present application. Applicants respectfully submit that claims 1-62 are pending, however, although claims 20-62 were withdrawn from consideration in response to the Restriction Requirement issued April 18, 2002, they were not cancelled.

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Applicants submit that claims 59-62 were therefore also withdrawn from consideration as belonging to nonelected Group III.

In the Office Action Summary at item 9, the Examiner objected to the specification, but he did not provide any explanation for the objection in the Detailed Action. As a result, Applicants are unable to respond to this objection.

Along with the Office Action, the Examiner returned a form PTO-1449 initialed to indicate that references cited by Applicants had been examined. However, the Examiner did not initial the reference "GIF Image 1203x697 pixels," visited at [www.partek.com/frags.gif](http://www.partek.com/frags.gif) on 4/15/99. In a telephone conversation, the Examiner indicated that this was an inadvertent omission, and that he would provide a new PTO-1449 with this reference initialed.

The Office Action also included a form PTO-948 Notice of Draftsperson's Review. In the Notice, the Draftsperson objected to the margins and lines of various figures. By this Amendment, Applicants have submitted substitute drawings correcting these defects. Accordingly, Applicants respectfully request withdrawal of these objections.

**Reply to the Office Action**

The Examiner objected to claims 5 and 16-18 due to certain informalities. By this Amendment, Applicants have amended claims 5 and 16 to correct the noted informalities, and canceled claim 18 without prejudice or disclaimer of the subject matter thereof. Accordingly, Applicants respectfully request withdrawal of these objections.

The Examiner rejected claims 8 and 14 under 35 U.S.C. § 112 due to insufficient antecedent basis. By this Amendment, Applicants have amended claims 8 and 14 to more distinctly claim what Applicants regard as their invention. Accordingly, Applicants respectfully request withdrawal of these rejections.

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Rejections under 35 U.S.C. § 102(e)

The rejections of claims 1-3, 6, 8, 14 and 15 as being unpatentable under 35 U.S.C. § 102(e) are respectfully traversed, since a *prima facie* case of anticipation has not been made by the Examiner. In order to properly anticipate Applicants' claimed invention under 35 U.S.C. § 102(e), each and every element of the claim in issue must be found, either expressly described or under principles of inherency, in a single prior art reference. Furthermore, "[t]he identical invention must be shown in as complete detail as is contained in the claim." See M.P.E.P. § 2131(8<sup>th</sup> Ed. Aug. 2001), quoting *Richardson v. Suzuki Motor Co.*, 868 F.2d 1126, 1236 (Fed. Cir. 1989). Finally, "[t]he elements must be arranged as required by the claim." M.P.E.P. § 2131 (8<sup>th</sup> Ed. 2001). Applicants submit that these requirements have not been met for at least the following reasons.

Independent claim 1 recites a combination including, for example, "selecting a set of attributes associated with an object, wherein the attributes selected comprise a plurality of data types selected from a group consisting of a text data type, a numerical data type, a categorical data type, and a sequence data type." Applicants respectfully submit that Fayyad does not disclose at least this feature. Fayyad does disclose that "[e]ach record has many attributes or fields which for a representative database might include age, income, number of children, number of cars owned etc." Col. 5:22-24. Fayyad also uses such mathematical functions such as K-means clustering, sums, means, and covariance, however, all of these functions require data to be in numeric form. See Col. 6:9-37. Applicants respectfully submit that nowhere does Fayyad disclose data of types other than numeric. Therefore, Fayyad does not disclose at least "selecting a set of attributes associated with an object, wherein the attributes selected comprise a plurality of data types selected from a group consisting of a text data type, a numerical data type, a

categorical data type, and a sequence data type.” Accordingly, Applicants respectfully submit that claim 1 is allowable. By virtue of its dependence from claim 1, Applicants also submit that claim 20 is allowable.

Independent claim 2 recites a combination including, for example, “defining a uniform data structure for representing objects of different data types.” The Examiner has alleged that this limitation is disclosed by Fayyad at Figures 6A-6D, and at Column 8, lines 15-64.

Applicants respectfully disagree. Fayyad discloses four distinct data structures, each of which is merely an array of pointers to numeric data. For example, Fayyad discloses that:

Fig. 6A depicts a data structure designated DS including an array 160 of pointers, each of which identifies a vector 162 of n elements (floats) ‘Sum’, a vector 164 of n elements (floats ‘SumSq’, and a scalar 166 designated as M. Col. 8: 24-28.

Applicants respectfully submit that both floats and scalars are numeric data types, and therefore only one data type (numeric) is represented by the data structure DS. Similarly, the other data structures, “MODEL” (Col. 8:17-23), “CS” (Col. 8:28-32), and “RS” (Col. 8:33-41) also represent only a numeric data type. This conclusion is further supported by Table 1, which shows “a list of ten SDATA vectors which constitute sample data from a database 10 and are stored as individual vectors in the data structure RS.” Col. 8:48-50. All data in Table 1 is shown as whole numbers. Applicants therefore submit that Fayyad does not, at Col. 8 or Figures 6A-D, disclose at least, “defining a uniform data structure for representing objects of different data types” as asserted by the Examiner. Furthermore, for the reasons set forth regarding claim 1, Applicants respectfully submit that nowhere else does Fayyad disclose a data type other than numeric. For at least this reason, Fayyad fails to disclose “defining a uniform data structure for

representing objects of different data types.” Accordingly, Applicants respectfully submit that claim 2, and claims 3-15, by virtue of their dependence from allowable claim 2, are allowable.

Rejections under 35 U.S.C. § 103

The rejections of claims 4-5, 7, 9-13, and 16-19 as unpatentable under 35 U.S.C. § 103 are respectfully traversed, since a *prima facie* case of obviousness has not been made by the Examiner. To establish a *prima facie* case of obviousness under 35 U.S.C. § 103, each of three requirements must be met. First, the reference or references, taken alone or in combination, must teach or suggest each and every element recited in the claims. Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the references in a manner resulting in the claimed invention. Third, a reasonable expectation of success must exist. Moreover, each of these requirements must “be found in the prior art, and not be based on applicant’s disclosure.” (See M.P.E.P. § 2143 (8<sup>th</sup> Ed. 2001)). Applicants submit that these requirements have not been met for at least the following reasons.

Regarding the rejection of dependent claims 4 and 5, the Examiner admitted that “Fayyad et al. do [sic] not explicitly disclose the method of Claim 3 [sic] wherein said plurality of different data types comprise a combination of any three of numeric, reference string, categorical, in [sic] data types.” The Examiner asserted, however, that Strasnick et al. discloses “a method for visualization of different data types comprising a combination of numeric, reference string, categorical, in [sic] text data types.” Applicants respectfully disagree and submit that neither Strasnick nor Fayyad disclose or suggest the elements of claims 4 and 5.

Regarding this rejection, independent claim 2, from which claims 4 and 5 (as well as claim 3) depend, recites a combination including, for example, “defining a uniform data structure

for representing objects of different data types.” As discussed above, regarding claim 2, Fayyad does not disclose at least this feature. In addition, Strasnick does not cure this deficiency.

Strasnick discloses that

A data block 110 is the basic unit of individual data. A data file appears as a data block 110 within the information landscape. The data block's attributes are represented by mapping of the data block's attributes to visible and audible characteristics such as height, shape, color, saturation, sound, text, animation, icon or some other perceptible sensation. Col. 4:16-21.

In one embodiment of Strasnick, the data blocks “may be utilized to represent files” (Col. 5:58-59), and in another embodiment, may be used to “represent cumulative sales information” (Col. 6:43-45). Strasnick nowhere indicates that data objects of different types can be used simultaneously within any one embodiment. The Examiner has instead asserted that the *attributes* of Strasnick's data blocks may be of different types (i.e. text and numeric, as shown in Figures 10A and 10B), and that the visual *representation* of the data blocks may utilize features such as “visible and audible characteristics such as height, shape, color, saturation, sound, text, animation, icon or some other perceptible sensation” (Col. 4:19-21 and Figure 2A). This is not “objects of different data types,” as required by claim 2 (and therefore dependent claims 3-15 by virtue of their dependence on claim 2). Applicants therefore submit that neither Strasnick nor Fayyad disclose or suggest this feature. Accordingly, Applicants respectfully submit that independent claim 2, and dependent claims 3-15, are allowable.

Regarding the rejection of claims 7 and 9-11 under Fayyad in view of J.C. Roberts, independent claim 2, from which claims 7 and 9-11 depend, recites a combination including, for example, “defining a uniform data structure for representing objects of different data types.” As discussed above, regarding claim 2, Fayyad does not disclose at least this feature. In addition,

the Examiner has not shown how J.C. Roberts allegedly cures this deficiency. J.C. Roberts encourages the use of “multiple views of the same data,” but is silent as to the makeup or composition of the data, i.e., whether it is of different types. Applicants therefore respectfully submit that J.C. Roberts does not cure the deficiencies of Fayyad. Accordingly, claims 2, 7, and 9-11 are allowable.

Regarding independent claim 16 (and corresponding dependent claim 17), the Examiner rejected claim 16 under “arguments analogous to those presented for Claims 2 and 9.” M.P.E.P. § 707.07(d) requires that “a plurality of claims should never be grouped together in a common rejection, unless that rejection is equally applicable to all claims in that group.” Applicants respectfully submit that while claim 16 may recite some features common to claims 2 and 9, claim 16 recites features not recited in claims 2 or 9. For example, claim 16 recites a combination including, “displaying first graphical results of a first type analysis performed on selected attributes of a first data set,” and “displaying second graphical results of a second type analysis performed on selected attributes of a second data set.” These features are not present in either claim 2 or 9. Consequently, Applicants submit that, in accordance with M.P.E.P. § 707.07(d), the rejection of claims 2 and 9 is not “equally applicable” to claims 16-17, and is therefore improper. Applicants further submit that neither Fayyad nor J.C. Roberts discloses or suggests the recited features of claims 16-17, and the Examiner has not cited any reference disclosing or suggesting these features. Accordingly, Applicants respectfully submit that claims 16-17 are therefore allowable.

Regarding independent claim 19, the rejection cited “arguments analogous to those presented for Claims 2, 6, and 9,” without further discussion. Applicants respectfully disagree that claim 19 is analogous to claim 2, 6 or 9. However, claim 19 does recite a combination

including at least “different types of data,” “a first type of data,” and “a second type of data.” For at least the reasons provided above, regarding claims 2 and 9, neither Fayyad nor J.C. Roberts disclose or suggest at least “different types of data,” “a first type of data,” and “a second type of data.” Accordingly, Applicants submit that claim 19 is allowable.

Regarding the rejection of claims 12 and 13, the Examiner asserted that it would have been obvious to one of ordinary skill in the art to combine Fayyad and Mohammed to achieve the combination recited in claims 12 and 13. Applicants respectfully disagree. Claim 2, from which claims 12 and 13 depend, recites a combination including, for example, “defining a uniform data structure for representing objects of different data types.” As discussed above regarding claim 2, Fayyad does not disclose at least this feature. Applicants respectfully submit that Mohammed does not cure this deficiency. Mohammed discloses methods of word recognition. All objects are therefore in textual form. Mohammed does not disclose any other data types. Therefore, neither Mohammed nor Fayyad disclose or suggest at least “defining a uniform data structure for representing objects of different data types.” Accordingly applicants submit that claims 2, 12 and 13 are therefore allowable.

### New Claims

Applicants have added new claims 63 and 64. The addition of claims 63 and 64 do not add new subject matter. Support for the new claims can be found throughout the specification and claims as originally filed. Furthermore, Applicants respectfully submit that new claims 63 and 64 properly belong in elected Group I, characterized by the Examiner as drawn to “methods and systems for analyzing various data type [sic] to identify cluster groups of related objects.”

Applicants respectfully submit that new claims 63 and 64 are allowable as the cited art does not disclose or suggest the claimed elements.



**Conclusion**

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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**APPENDIX TO AMENDMENT OF OCTOBER 31, 2002**  
**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**AMENDMENTS TO THE CLAIMS**

1. (Amended) A method for analyzing data for different data types, comprising:

selecting a set of attributes associated with an object, wherein the attributes selected  
comprise a plurality of data types [selection] selected from [the] a group consisting of [any of  
the] a text data type, a numerical data type, a categorical data type, [or] and a sequence data  
[types] type;

transforming the selected attributes into n-dimensional vectors;

applying transformation operations to the selected attributes;

indexing the n-dimensional vector, certain attributes, and a result of the transformation  
operations; and

displaying a representation of the object based on the selected attributes.

2. (Amended) A [computer-implementing] computer-implemented method of analyzing  
various data types, comprising the steps of:

defining a uniform data structure for representing objects of different data types;

segmenting certain attributes of a plurality of different objects of different data types into  
elements that are representable in said uniform data structure; and

operating on said certain attributes to produce at least one representation of said objects  
based on said uniform data structure.

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4. (Amended) The method of claim 3 wherein said plurality of different data types comprise a combination of any three of numeric, reference string, categorical [in] and text data types.

5. (Amended) The method of claim 4 wherein said data types comprise a numeric data type, a sequence string data type[], a categorical data type and a text data type [types] .

8. (Amended) The method of claim 6 wherein said operating further produces a second vector representation [first and second representations are vector representations].

14. (Amended) The method of claim 2, further [comprises] comprising using said [first] representation to identify cluster groups of related objects.

16. (Amended) A method of identifying relationships among different visualizations of a plurality of data sets, each data set comprising a set of objects, comprising the steps of:

displaying first graphical results of a first type analysis performed on selected attributes of [on] a first data set [of objects];

displaying second graphical results of a second type analysis performed on selected attributes of a second data set;

selecting certain objects represented in said first graphical results; and

highlighting corresponding objects represented by said second graphical results that correspond to said certain objects.

19. (Amended) A system for producing visualizations for various data types, comprising:

- a first data processing engine operative to receive different types of data;
- a second data processing engine operative to modify a first type of said data to conform said data to a standardized format that is used in identifying relationships among attributes of objects contained in said data; and
- a third data processing engine for creating a first high dimensional vector for a second type of data and for creating a second high dimensional vector for the modified data, each data type being an input into said engine, wherein said high dimensional vectors are operative to be compared to identify relationships that exist between the first and second data type.